

(19) 世界知的所有権機関
国際事務局(43) 国際公開日
2003 年 7 月 31 日 (31.07.2003)

PCT

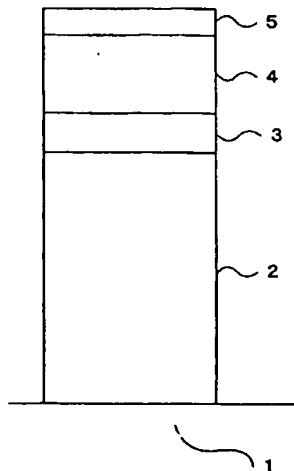
(10) 国際公開番号
WO 03/061885 A1

- (51) 国際特許分類: B23B 27/14, C23C 16/30 (71) 出願人 および
(21) 国際出願番号: PCT/JP03/00232 (72) 発明者: 岡田 吉生 (OKADA, Yoshio) [JP/JP]; 〒664-0016 兵庫県 伊丹市昆陽北一丁目 1 番 1 号 住友電気工業株式会社 伊丹製作所内 Hyogo (JP).
(22) 国際出願日: 2003 年 1 月 14 日 (14.01.2003) (72) 発明者: および
(25) 国際出願の言語: 日本語 (75) 発明者/出願人 (米国についてのみ): 森口 秀樹 (MORIGUCHI, Hideki) [JP/JP]; 〒664-0016 兵庫県 伊丹市昆陽北一丁目 1 番 1 号 住友電気工業株式会社 伊丹製作所内 Hyogo (JP).
(26) 国際公開の言語: 日本語
(30) 優先権データ: (74) 代理人: 中野 稔, 外 (NAKANO, Minoru et al.); 〒554-0024 大阪府 大阪市此花区 島屋一丁目 1 番 3 号 住友電気工業株式会社内 Osaka (JP).
特願 2002-10098 2002 年 1 月 18 日 (18.01.2002) JP
特願 2002-347391 2002 年 11 月 29 日 (29.11.2002) JP
(71) 出願人 (米国を除く全ての指定国について): 住友電気工業株式会社 (SUMITOMO ELECTRIC INDUSTRIES, LTD.) [JP/JP]; 〒541-0041 大阪府 大阪市中央区 北浜四丁目 5 番 33 号 Osaka (JP).
(81) 指定国 (国内): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,

[続葉有]

(54) Title: SURFACE-COATED CUTTING TOOL

(54) 発明の名称: 表面被覆切削工具



(57) Abstract: A surface-coated cutting tool, which comprises a substrate and, formed on the surface thereof, an inner layer (2), an intermediate layer (3) and an outer layer (4), wherein the inner layer (2) comprises at least one material selected from the group consisting of a carbide, a nitride, a carbonitride, a boride, a boronitride, a boronitrilic carbide, an oxide, a carboxide, an oxynitride and a carbonitrilic oxide of the elements of the Groups IVa, Va and VIa of the Periodic Table and contains a layer comprising a cylindrical structure, the outer layer (4) comprises at least one oxide layer selected from the group consisting of an aluminum oxide, a titanium oxide, a hafnium oxide and a zirconium oxide, and the intermediate layer (3) comprises a boronitrilic titanium TiB₂N_y, wherein x and y represents atomic %, satisfying the formula (1): $0.001 < x/(x+y) < 0.04$ --- (1), and wherein the intermediate layer (3) has an average film thickness of 0.1 to 1 μm and has a surface roughness such that the perpendicular distance between a mountain-top line and a valley bottom line is 0.05 to 500 μm for a standard length of 1 μm. The surface-coated cutting tool allows the suppression of the exfoliation of a film caused associated with the welding of a material to be cut to the tool.

[続葉有]



TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU,
ZA, ZM, ZW.

- (84) 指定国 (広域): ARIPO 特許 (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ特許 (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI 特許 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

添付公開書類:

- 国際調査報告書
- 請求の範囲の補正の期限前の公開であり、補正書受領の際には再公開される。

2文字コード及び他の略語については、定期発行される各PCTガゼットの巻頭に掲載されている「コードと略語のガイダンスノート」を参照。

(57) 要約:

溶着に伴う膜剥離を抑制できる表面被覆切削工具を提供する。

基体表面に内側層(2)、中間層(3)、外側層(4)を形成する。内側層(2)は、周期律表Ⅳa、Ⅴa、Ⅵa族の炭化物、窒化物、炭窒化物、硼化物、硼窒化物、硼窒炭化物、酸化物、炭酸化物、酸窒化物、炭窒酸化物よりなる群から選択される少なくとも一種の材料で構成され、かつ柱状組織からなる層を含む。外側層(4)は、酸化アルミニウム、酸化ジルコニウム、酸化ハフニウムおよびそれらの固溶体よりなる群から選択される少なくとも一種の酸化物層からなる。中間層(3)は、式1を満たす硼窒化チタン TiB_xNy ($x, y: atomic\%$) からなる。

$$0.001 < x / (x + y) < 0.04 \quad \cdots \text{式1}$$

この中間層(3)の平均膜厚を $0.1 \sim 1 \mu m$ とし、かつ基準長さ $1 \mu m$ の表面粗さで、山頂線と谷底線との間の垂直距離を $50 \sim 500 nm$ とする。

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

NAKANO, Minoru
c/o Sumitomo Electric Industries,
Ltd.
1-3, Shimaya 1-chome, Konohana-ku
Osaka-shi, Osaka 554-0024
Japan



Date of mailing (day/month/year)
26 August 2003 (26.08.03)

Applicant's or agent's file reference
102332-WO-00

International application No.
PCT/JP03/00232

IMPORTANT NOTIFICATION

International filing date (day/month/year)
14 January 2003 (14.01.03)

1. The following indications appeared on record concerning:

☒ the applicant ☒ the inventor ☐ the agent ☐ the common representative

Name and Address

OKADA, Yoshio
c/o Itami Works of Sumitomo
Electric Industries, Ltd.
1-1, Koyakita 1-chome
Itami-shi, Hyogo 664-0016
Japan
(Applicant and inventor for all designated
States.)

State of Nationality
JP

State of Residence
JP

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☐ the name ☐ the address ☐ the nationality ☐ the residence

Name and Address

OKADA, Yoshio
c/o Itami Works of Sumitomo
Electric Industries, Ltd.
1-1, Koyakita 1-chome
Itami-shi, Hyogo 664-0016
Japan
(Applicant for US and inventor for all designated
States.)

State of Nationality
JP

State of Residence
JP

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office ☒ the designated Offices concerned
☐ the International Searching Authority ☐ the elected Offices concerned
☐ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 338.90.90

Authorized officer

Hitomi ODAKA (Fax 338 9090)

Telephone No. (41-22) 338 9417

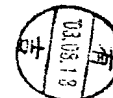
PCT

From the INTERNATIONAL BUREAU

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

NAKANO, Minoru
c/o Sumitomo Electric Industries, Ltd.
1-3, Shimaya 1-chome, Konohana-ku
Osaka-shi, Osaka 554-0024
JAPON

Date of mailing(day/month/year) 31 July 2003 (31.07.03)		IMPORTANT NOTICE	
Applicant's or agent's file reference 102332-WO-00			
International application No. PCT/JP03/00232	International filing date(day/month/year) 14 January 2003 (14.01.03)	Priority date(day/month/year) 18 January 2002 (18.01.02)	
Applicant SUMITOMO ELECTRIC INDUSTRIES, LTD.			

1. Notice is hereby given that the International Bureau has **communicated**, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

None

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

None

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this notice is a copy of the international application as published by the International Bureau on 31 July 2003 (31.07.03) under No. 03/061885

4. **TIME LIMITS for filing a demand for international preliminary examination and for entry into the national phase**

The applicable time limit for entering the national phase will, **subject to what is said in the following paragraph**, be **30 MONTHS** from the priority date, not only in respect of any elected Office if a demand for international preliminary examination is filed before the expiration of **19 months** from the priority date, but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see *PCT Gazette* No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the *PCT Newsletter*, October and November 2001 and February 2002 issues.

In practice, **time limits other than the 30-month time limit** will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For **regular updates on the applicable time limits** (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

For filing a demand for international preliminary examination, see the *PCT Applicant's Guide*, Volume I/A, Chapter IX. Only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

It is the applicant's **sole responsibility** to monitor all these time limits.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Judith Zahra
Facsimile No.(41-22) 740.14.35	Telephone No.(41-22) 338.91.11

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☒ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☒ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.